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FIRST ANNUAL REPORT

OF THE

CHARLES RIVER BASIN COMMISSION.

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OCTOBER 1, 1903.

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The State Board of Publication.

Lindgrove.
August 5 1903

Commonwealth of Massachusetts.

REPORT OF THE COMMISSION.

To His Excellency the Governor and the Honorable Council of the Commonwealth of Massachusetts.

The commission appointed under chapter 465 of the Acts of the year 1903, and termed the Charles River Basin Commission, has the honor to make the following report of its proceedings and expenditures, in accordance with section 2 of the act establishing the commission. According to chapter 9, section 5, of the Revised Laws of Massachusetts for 1902, such reports shall include the year ending on the thirtieth day of September; and, as the commission had been at this date but two months in existence, it necessarily follows that only a very brief account of its work can be given.

The act establishing the commission was approved on June 24, 1903, and the present members of the commission were confirmed at a meeting of the Governor and Council on July 22, 1903. The members of the commission qualified on July 29, and there was held on that day, at the office of the president of the Massachusetts Institute of Technology, the first meeting of the Charles River Basin Commission, there being present the chairman, Henry S. Pritchett, and the commissioners, Henry D. Yerxa and Joshua B. Holden.

The first work of the commission was to familiarize itself with the duties committed to it under the act by which it was created. As the principal work of the commission consists in the carrying out of certain engineering projects, it naturally followed that the selection and organization of an engineering staff was the earliest, as well as the most important, task to which the commission could address itself;

and the two months of its existence covered by the year ending Sept. 30, 1903, were almost entirely given to this problem, and to that of finding quarters suitable for the work of the commission and its engineers.

After the most careful inquiry, and consultation with leading engineers of the country, an engineering staff was selected, as follows: —

Mr. Hiram A. Miller, . .	*Chief Engineer.*
Mr. Frederic P. Stearns, . .	*Consulting Engineer.*
Mr. John L. Howard, . .	*Division Engineer, in charge of surveys, construction and field work.*
Mr. Frank E. Winsor, . .	*Division Engineer, in charge of designing, drafting and office work.*
Mr. John N. Ferguson, . .	*Assistant Engineer.*

In addition, Miss Jennie L. Rawson was engaged as stenographer and clerk.

The appointments of the chief engineer and consulting engineer have already been reported to the Governor and Council, and received their approval.

After a very careful study of the needs of the commission, and in view of its engineering problems, a lease was taken, for a period of one year, of seven rooms in the Standish building, 367 Boylston Street, at a rental of $2,100. These quarters have proved admirably adapted for the needs of the commission, as the rooms are unusually well lighted and afford admirable places for drafting tables. The selection of these quarters has also been approved by the Governor and Council.

In addition to the organization of an engineering staff and the securing of quarters suitable for work, the commission busied itself during the months of August and September in the effort to become acquainted with the present situation of the problems committed to it, and with consulting other similar commissions, such as the Metropolitan Water and Sewerage Board, the office of the sewer division of the city of Boston and the Board of Park Commissioners of Boston, the work of which has most to do with its own.

By the end of September the engineering staff of the commission had been selected and organized, the quarters for the use of the commission and of its engineers were in order,

and the work had been begun. Arrangements were made for beginning at once the field work of borings along the proposed site of the dam, and the preparation of designs was begun in the office for the preliminary studies of the dam itself and of the lateral conduits.

The organization of an engineering staff, the preparation of quarters and the preliminary examination of the problems themselves committed to the commission have constituted practically the work which the commission has been able to accomplish in the two months of its existence which are included in this report.

In carrying forward this organization the commission has endeavored to carry out the provisions of the act in the most thorough way, and with the strictest view to economy. No expense has been incurred, either in the engineering department or in the executive work, which could be avoided, and the commission has increased its organization and its force only so rapidly as the requirements of the work demanded.

A statement of the expenditures incurred by the commission and of its assets and liabilities to September 30 is as follows: —

Expenditures.

The total amount of expenditures from July 29, 1903, the time of the organization of the commission, until Sept. 30, 1903, was $433.01.

The general character of these expenditures was as follows: —

Administration.		
Clerks and stenographers,	$15 00	
Stationery and printing,	5 10	
Postage, express and telegrams,	1 00	
Furniture and fixtures,	12 20	
		$33 30
Engineering.		
Engineering assistants,	$60 00	
Travelling,	10 00	
Wagon hire,	4 50	
Stationery and printing,	7 63	
Postage, express and telegrams,	4 20	
Instruments and tools,	87 75	
Amounts carried forward,	$174 08	$33 30

Amounts brought forward,	$174 08	$33 30
Books, maps and photographic supplies,	6 00	
Furniture and fixtures,	219 48	
Unclassified supplies,	15	
		399 71
Total,		$433 01

The foregoing expenditures have been distributed among the various objects or works, as follows: —

Administration, applicable to all parts of the work,	$33 30
Dam,	119 00
Lock,	72 98
Drawbridge,	13 28
Dredging basin,	7 00
Broad canal,	32 00
Lechmere canal,	16 10
Boston marginal conduit,	106 00
Cambridge marginal conduit,	33 35
Total,	$433 01

Assets.

The only purchases which have thus far been made are those incidental to the organizing of the general office. The only assets, therefore, are office furniture and fittings, and engineering and drafting instruments and tools.

Liabilities.

Current bills unpaid,	$1,050 00
Due on pay rolls,	1,810 00
Total,	$2,860 00

There are no claims pending against the commission.

Attached hereto is a report of the chief engineer, also a copy of the act under which the commission was organized and is proceeding.

Respectfully submitted,

HENRY S. PRITCHETT,
HENRY D. YERXA,
JOSHUA B. HOLDEN,
Charles River Basin Commission.

Boston, Jan. 7, 1904.

REPORT OF THE CHIEF ENGINEER.

To the Charles River Basin Commission.

GENTLEMEN: — The following is a report of the work of the engineering department for the portion of a year ending Sept. 30, 1903.

The chief engineer was appointed on August 21, and assumed the duties of his position on September 28; but previous to that time he had, acting under the instructions of your commission, given some attention to the fitting up of the rooms in the Standish building, at 367 Boylston Street, assigned to the engineering department, and to the organization of the engineering force.

On September 8 Mr. John N. Ferguson was appointed assistant engineer, and Miss Jennie L. Rawson stenographer and clerk. Mr. Ferguson and Miss Rawson began their duties on the following day.

Two division engineers have been appointed: Mr. John L. Howard, who will have charge of surveys, construction and other field work; and Mr. Frank E. Winsor, who will have charge of the designing, drafting and other office work. Mr. Howard reported for duty on September 28, but Mr. Winsor had not reported during the time covered by this report.

The total engineering force on September 30 was 4.

The principal work of the engineering department has consisted of fitting up the offices; selecting engineering and drafting instruments and tools; purchasing furniture and stationery supplies; collecting plans, reports and other data from the former secretary of the committee on the Charles River dam, and from other sources; organizing the engineering force; making plans of a vault to be con-

structed in the basement of the Standish building; and arranging for records of the traffic through Craigie bridge draw, and for starting a boring force at the site of the dam and lock.

These borings are being made by the ordinary wash drill method. An outside pipe, called the "casing pipe," is driven into the ground. The material inside the pipe is washed up by a jet of water forced by a hand pump through a smaller interior pipe, known as the "wash pipe," to the bottom of the boring, the action of the water being assisted by a chisel-pointed tool attached to the end of the wash pipe. Unwashed samples of the material through which the boring is made are taken about every five feet, or whenever the material changes, and are obtained by substituting for the cutting tool at the end of the wash pipe a short pipe with the lower end open, which is driven into the bottom of the boring; or, in case the material will not adhere to the side of the pipe, a valve is provided at the lower end, to close when the pipe is lifted.

The boring force began work on September 29, and has completed one boring, 56.3 feet in depth.

Respectfully submitted,

HIRAM A. MILLER,
Chief Engineer.

Boston, Jan. 1, 1904.

APPENDIX.

[Chapter 465 of the Acts of the Year 1903.]

An Act to authorize the Construction of a Dam across the Charles River between the Cities of Boston and Cambridge.

Be it enacted, etc., as follows:

Section 1. The governor of the Commonwealth, with the advice and consent of the council, shall appoint three commissioners, residents of the metropolitan parks district, who shall constitute the Charles river basin commission, hereinafter called the commission, and who shall be sworn before entering upon the duties of their office. One commissioner shall be designated by the governor as chairman, and two commissioners shall constitute a quorum. The term of office shall be three years, and all vacancies shall be filled by the governor, with the advice and consent of the council. Any commissioner may be removed by the governor, with the advice and consent of the council, for such cause as he shall deem sufficient and shall assign in the order of removal. Each commissioner shall receive an annual salary of such amount as the governor and council shall determine.

Charles river basin commission, appointment, term, etc.

Compensation.

Section 2. The commission may appoint a secretary, engineers and assistants, shall keep accurate accounts of its expenditures, and shall make an annual report of its doings, including an abstract of its accounts, to the governor and council. The commission, whenever the Commonwealth has been authorized by the United States to build a dam and lock under the provisions of this act, shall proceed to do the work herein required of it, and shall in the meantime make examinations and plans herefor.

Powers and duties.

Section 3. The commission shall construct across Charles river, between the cities of Boston and Cam-

Dam to be constructed across Charles river, etc.

bridge, a dam, at least sufficiently high to hold back all tides and to maintain in the basin above the dam a substantially permanent water level not less than eight feet above Boston base. The dam shall occupy substantially the site of the present Craigie bridge, which shall be removed by the commission. The dam shall be not less than one hundred feet in width at said water level, and a part thereof shall be a highway and the remainder shall be a highway, or a park or parkway, as the commission shall determine. The dam shall be furnished with a lock not less than three hundred and fifty feet in length between the gates, forty feet in width and thirteen feet in depth below Boston base, and shall be built with a suitable drawbridge or drawbridges, wasteways and other appliances. The part of the dam used as a highway shall be maintained and operated in the same manner as the Cambridge bridge, and under the laws now or hereafter in force relating to said bridge.

Navigable channels to be dredged.

SECTION 4. The commission shall dredge navigable channels in the basin from the lock to the wharves between the dam and Cambridge bridge, to Broad canal and to Lechmere canal, the channel to be not less than one hundred feet in width and eighteen feet in depth; shall dredge Broad canal to such depths as will afford to and at the wharves thereon not less than seventeen feet of water up to the Third street draw, not less than thirteen feet of water from the Third street draw to the Sixth street draw, and not less than eleven feet of water from the Sixth street draw to the railroad draw, and not less than nine feet of water for one hundred and twenty-five feet above the railroad draw; shall dredge Lechmere canal to such depths as will afford to and at the wharves thereon not less than seventeen feet of water up to and including Sawyer's lumber wharf, and not less than thirteen feet of water from said wharf up to the head of the canal at Bent street; all depths aforesaid to be measured from the water level to be maintained in the basin.

Manner of dredging, etc.

The commission shall do all such dredging and all strengthening of the walls of the canals and of the basin where dredging is done by the driving of prime oak piles

two feet on centres along the front of said wharves or walls, and all removing and relocating of pipes and conduits made necessary by such dredging, so that vessels requiring a depth of water not exceeding the respective depths above prescribed can lie alongside of, and in contact with, the wharves; and this work shall be done in such manner as to cause the least possible inconvenience to abutters, and shall be finished on or before the completion of the dam; and after the walls or wharves have been so strengthened, all repairs on or rebuilding of the walls and wharves shall be done by the abutters.

Certain other dredging to be done, etc.

The commission shall do such dredging in the basin outside of the channels aforesaid as may be necessary for the removal of sewage, sludge or any offensive deposit; shall do such other dredging as it shall deem proper, and shall take all proper measures for the destruction of malarial mosquitoes in the basin and its vicinity.

Marginal conduits to be constructed, etc.

SECTION 5. The commission, before the completion of the dam, shall construct marginal conduits on the north side of the basin from the outlet of the overflow channel in Binney street to a point below the dam, and on the south side of the basin from the present outlet of the Back Bay Fens to a point below the dam, and may construct an extension thereof toward, or to, St. Mary street, the conduits to be used to receive and conduct below the dam the overflow from sewers and the surface drainage and other refuse matter which would otherwise pass into the basin.

Certain lands, etc., may be taken, etc.

SECTION 6. The commission, for the purpose of carrying out the provisions of the preceding sections, may from time to time take in fee or otherwise, by purchase or otherwise, for the Commonwealth, or the city of Boston or the city of Cambridge, as the commission shall determine, lands, flats and lands covered by tide water on Charles river, by filing in the registry of deeds for the county and district in which the lands or flats are situated a description thereof, sufficiently accurate for identification, signed by a majority of the commissioners; and any person whose property is so taken may have compensation therefor as determined by agreement with the commission,

and if they cannot agree, the compensation may be determined by a jury in the superior court for the county where the property is situated under the same provisions of law, so far as they are applicable, which apply in determining the value of lands taken for highways under chapter forty-eight of the Revised Laws, upon petition therefor by the commission, or by such person, filed in the clerk's office of said court against the Commonwealth or the city for which the lands or flats are taken within one year after the taking, and costs shall be taxed and execution issued as in civil cases.

The metropolitan park commission to have exclusive control of dam, etc.

SECTION 7. The metropolitan park commission, when the work provided for in the preceding sections is finished, shall, subject to the powers vested by law in the state board of health, have exclusive control of the dam and lock and of the basin and river between the dam and the city of Waltham, as a part of the metropolitan parks system, and of all poles, wires and other structures placed or to be placed on, across, over or in any part of said basin, dam or lock, and of the placing thereof, except the part of the dam used as a highway and the bridges and other structures erected by any city or town within its limits and upon its own lands; may make reasonable rules and regulations, not impairing freight traffic, for the care, maintenance, protection and policing of the basin; and throughout the year shall operate the lock without charge, maintain the lock, channels and canals aforesaid at the depths aforesaid, and clear of obstructions caused by natural shoaling or incident to the building of the dam, and maintain the water in the basin at such level, and the lock, channels and canals sufficiently clear of obstructions by ice so that any vessel ready to pass through the lock, and requiring no more depth of water than aforesaid, can pass through to the wharves aforesaid. In the event of an emergency, requiring the temporary reduction of such level, notice thereof shall be given to the occupants of said wharves, and such reduction shall not be lower nor continue longer than the emergency requires. Said metropolitan park commission may order the removal of all direct sewage or factory waste as a common nuisance

May make rules and regulations, etc.

Notice to be given in case of emergency requiring temporary reduction of level, etc.

Removal of direct sewage or factory waste may be ordered, etc.

from the river and its tributaries below the city of Waltham; and no sewer, drain, overflow or other outlet for factory or house drainage shall hereafter be connected with the basin below said city without the approval of the metropolitan park commission.

Payment of expenses.

SECTION 8. The Commonwealth shall in the first instance pay all expenses incurred in carrying out the provisions of the preceding sections, and the same shall, except as provided in the following section, constitute part of the cost of construction and maintenance of the metropolitan parks system; and in addition to the amounts heretofore authorized for such construction the treasurer and receiver-general shall, from time to time, as authorized by the governor and council, issue notes, bonds or scrip, in the name and behalf of the Commonwealth, entitled Charles River Basin Loan, to the amount which the commission may deem necessary for the expenses incurred under the first six sections of this act; and all acts and parts of acts relative to loans for such construction and providing for their payment shall, so far as they may be applicable and not inconsistent herewith, apply to such notes, bonds and scrip and to their payment.

Charles River Basin Loan.

Apportionment of expenses, etc.

SECTION 9. The commissioners next appointed under the provisions of chapter four hundred and nineteen of the acts of the year eighteen hundred and ninety-nine, and amendments thereof, in apportioning the expenses of maintaining the metropolitan parks system shall include as part thereof the expense of maintenance incurred under the preceding sections of this act; shall also determine, as they shall deem just and equitable, what portion of the total amount expended for construction under sections three, four, five and six of this act shall be apportioned to the cities of Boston and Cambridge as the cost of the removal of Craigie bridge and the construction of a suitable bridge in place thereof, and the remainder shall be considered and treated as part of the cost of construction of the metropolitan park system. The treasurer and receiver-general shall determine the payments to be made each year by said cities, one-half by each, to meet the interest and sinking fund require-

ments for the amounts apportioned to them as the cost of such bridge, and the same shall be paid by each city into the treasury of the Commonwealth as part of its state tax.

City of Boston to do certain dredging, construct conduits, sewer, etc.

SECTION 10. The city of Boston, by such officer or officers as the mayor may designate, shall forthwith after the passage of this act do such dredging in the Back Bay Fens as the board of health of said city may require; shall construct a conduit between Huntington avenue and Charles river, to form an outlet into Charles river for the commissioners' channel of Stony brook; shall reconstruct the present connections between the river and the Fens so as to allow free access of water from the river into the streams and ponds in the Fens and thence into the river; and shall construct a sewer in the rear of the houses on the north side of Beacon street between Otter and Hereford streets. Such officer or officers may construct a conduit between Green street and Forest Hills, and may construct or rebuild within five years one or more conduits for Stony brook between the westerly side of Elmwood street and the Fens: *provided, however*, that the expense of such conduits between Green street and Forest Hills and between Elmwood street and the Fens shall be paid for out of the annual appropriation for sewer construction, under the provisions of chapter four hundred and twenty-six of the acts of the year eighteen hundred and ninety-seven and acts in amendment thereof or in addition thereto.

Proviso.

Wall or embankment may be built on Boston side of Charles river.

SECTION 11. The board of park commissioners of Boston may, with the approval of the mayor, build a wall or embankment on the Boston side of Charles river, beginning at a point in the southwest corner of the stone wall of the Charlesbank, thence running southerly by a straight or curved line to a point in Charles river not more than three hundred feet distant westerly from the harbor commissioners' line, measuring on a line perpendicular to the said commissioners' line at its intersection with the southerly line of Mount Vernon street, but in no place more than three hundred feet westerly from said commissioners' line; thence continuing southerly and

westerly by a curved line to a point one hundred feet or less from the wall in the rear of Beacon street; thence by a line substantially parallel with said wall to the easterly line of the Back Bay Fens, extended to intersect said parallel line.

Certain lands, flats, etc., may be taken for a public park.

SECTION 12. The board of park commissioners of said city may take, in fee or otherwise, by purchase or otherwise, for said city, for the purpose of a public park such lands, flats and lands covered by tide water between Charles, Brimmer and Back streets and the line of the wall or embankment aforesaid, as the mayor shall approve, by filing in the registry of deeds for the county of Suffolk a description thereof sufficiently accurate for identification, signed by a majority of the commissioners, and shall construct a public park on the lands so taken; and any person whose property is so taken may have compensation therefor as determined by agreement with the board, and if they cannot agree, the amount thereof may be determined by a jury in the superior court for the county of Suffolk, under the same provisions of law, so far as they may be applicable, which apply in determining the value of lands taken for highways under chapter forty-eight of the Revised Laws, upon petition therefor by the board, or by such person, filed in the clerk's office of said court against said city within one year after the taking, and costs shall be taxed and execution issued as in civil cases.

City of Boston to pay certain expenses, etc.

SECTION 13. The city of Boston shall pay the expenses incurred under sections ten, eleven and twelve of this act, except as otherwise provided in section ten of this act; and to meet said expenses the city treasurer of the city shall, from time to time, on the request of the mayor, issue and sell bonds of the city to an amount not exceeding eight hundred thousand dollars, and the bonds so issued shall not be reckoned in determining the legal limit of indebtedness of the city.

City treasurer to issue bonds, etc.

The Boston and Maine Railroad to remove certain structures, etc.

SECTION 14. The lock shall be built above the lower line of the dam, and the Boston and Maine Railroad shall, before the dam is completed, remove its bridge, piles and any other structures in Charles river which are southerly

or westerly of a line defined in red on a plan filed in the office of the board of harbor and land commissioners, marked "Plan showing line from above or southwest of which the Boston & Maine Railroad shall remove all of its structures in Charles River and between the harbor lines, May 25, 1903. Woodward Emery, Chairman of Harbor and Land Commissioners"; and may rebuild the same northerly and easterly of the line so defined. The draw in the new bridge shall not be easterly of nor more than fifty feet westerly from the location of the present draw, and shall be so located as to be directly opposite the lock. Within the limits herein prescribed the commission shall determine the position of the lock and draw.

Enforcement of provisions of act, etc.

SECTION 15. The supreme judicial court and the superior court shall, upon application of any party in interest, including any owner or occupant of property abutting on the basin or on Broad canal or Lechmere canal, have jurisdiction to enforce, or prevent violation of, any provision of this act, and any order, rule or regulation made under authority thereof.

Repeal.

SECTION 16. Chapter three hundred and forty-four of the acts of the year eighteen hundred and ninety-one, as amended by section one of chapter four hundred and thirty-five of the acts of the year eighteen hundred and ninety-three, and chapter five hundred and thirty-one of the acts of the year eighteen hundred and ninety-eight are hereby repealed.

When to take effect.

SECTION 17. This act shall take effect on the first day of July in the year nineteen hundred and three. [*Approved June 24, 1903.*

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Walls and wharves, repairing or rebuilding shall be done by abutters,	4	11
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Wasteways, dam shall be built with,	3	10